MATH NEWS

Volume 1 | 5th Grade – Unit 1 | 1st Nine Weeks

Unit 1 Focus

Multiplying Multi-Digit Whole Numbers

Math Parent Letter

Welcome back to school! We hope you had a fun and restful summer. We are so excited to begin a new year, and see your child's mathematical knowledge grow. This newsletter is designed to give parents and students a better understanding of the math concepts found in the Georgia Standards of Excellence. We look forward to teaching your child and helping them master these standards. This newsletter will discuss the standards learned in the first nine weeks of school.

UNIT 1GOALS:

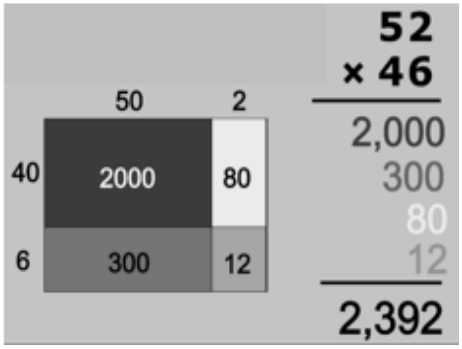
- Apply the rules for order of operations to solve problems involving whole numbers.
- Solve word problems involving the multiplication of 3-digit multiplicand by a 2 or 3-digit multiplier.
- Solve problems involving the division of 3- or 4-digit dividends by 2-digit divisors.
- Estimate and determine the volume of right rectangular prisms.
- Understand volume can be determined by finding the product of the area of the base times the height V = Bh and V = lwh.

Students will multiply multi-digit whole numbers using a multiple of strategies. For example, students will use the area model and partial product strategies as well as the U.S. Algorithm. In the following example, we see how to multiply using these methods.

Problem: There are 52 students in 5th Grade at Jones Elementary School. Each student needs about 46 dollars of supplies. How much will the students spend on supplies?

Area Model: Draw an array. Decompose the factors to make finding the partial products easier. Record the partial products. Finally, add the partial products together.

Scan codes for a video on the strategy.



Partial Product: Write the problem vertically. Decompose each of the factors and find the partial products. Finally, add the partial products together for the total product.

```
  52
 x46
2000   (40 x 50)
  80   (40 x 2)
 300   (6 x 50)
+ 12   (6 x 2)
2,392
```

Scan codes for a video on the strategy.

U.S. Algorithm: A step-by-step method for multiplication in columns where the partial products and regroupings are added at the same time.

```
   1
  52
 x46
 312   (6 x 52)
+2080  (40 x 52)
2392
```

VOCABULARY

Algorithm- a step-by-step method for computing.
Dividend- a quantity to be divided.
Divisor- the quantity by which another quantity is to be divided.
Equation- statement that two mathematical expressions have the same value indicated by the use of the equal sign.
Exponent- the number of times a number is to be used as a factor in a multiplication expression.
Expression- a mathematical phrase without an equal sign
Partial Product - an algorithmic method that takes base ten decompositions of factors, makes products of all pairs, and adds all products together.
Partial Quotient- an algorithmic method using successive approximation.
Product- the answer to a multiplication problem.
Volume – the amount of space occupied by an object measured in three dimensions, expressed in cubic units.

Dividing Multi-Digit Whole Numbers

Students will use the relationship between multiplication and division to divide. Students will be able to illustrate and explain their calculations by using equations or concrete models. In the following example, you will see the Partial Quotient strategy. Students will use this understanding when introduced to the traditional algorithm in sixth grade.

Problem: There are 1,716 students participating in Field Day. They are put into teams of 16 for the competition. How many teams get created? If you have left over students, what do you do with them?

Scan codes for a video on the strategy.

Student Sample: 1,716 ÷ 16

I know that I can multiply to find the quotient. I create the cluster problems to help me solve this problem. I know that 16 x 1 is 16 and 16 x 10 is 160, so 16 x 100 is 1600. When I subtract 1,600 from 1716, I have 116 students left over.
16 x 10 is too much so I try half; if 16 x 10 = 160, then 16 x 5 = 80. After I subtract, I have 36 students left over. I can double 16 and get 32 and then I will have 4 students left over. That means that I can make 107 teams with 4 students left over. Well, I can't leave students out of field day, so I would put 1 extra person on four of the teams, so there would be 103 teams of 16 and 4 teams of 17 students.

16 | 1,716		*Cluster Problems*
1,600	x 100	16 x 1 = 16
116		16 x 10 = 160
- 80	x 5	16 x 100 = 1600
36		16 x 5 = 80
- 32	x 2	16 x 2 = 32
4		
	107	Answer: 107 r. 4

Order of Operations:
Students can often rattle off the acronym PEMDAS or "Please Excuse My Dear Aunt Sally" as being associated with the *order of operations*. Putting this memory into practice can be more of a challenge.

Parenthesis
Exponents
Multiply / **D**ivide
Add + **S**ubtract

One misconception by students is that all multiplication should happen before all division because the *multiplication* comes before *division* in the acronym. In fact, multiplication and division have the same precedence and should be evaluated as they appear from left to right.

Incorrect	Correct
12÷3x4	12÷3x4
12÷12	4x4
1	16

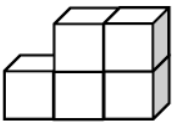
Similarly, *addition* comes before *subtraction* in the acronym, yet they have the same precedence.

Incorrect	Correct
4+10−5+8	4+10−5+8
14−13	14−5+8
1	9+8
	17

Measuring Volume and Application of Formulae

Following are some examples of the types of problems students will be working on in this unit:

1. The following solids are made up of 1-cm cubes. Find the volume of each figure, and write in the chart below.

A. 

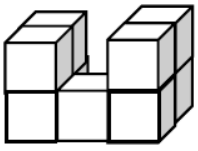
B. 

Figure	Volume	Explanation
A	5 cm^3 or 5 cubic cm	I counted the cubes.
B	9 cm^3 or 9 cubic cm	I counted 4 cubes on the right and then multiplied by 2 to include the cubes of the left side and then added the cube in the middle.